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Don Kaldor Memorial Lecture "Concepts Of Entrepreneurship And Agricultural Research"

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Don Kaldor Memorial Lecture "Concepts Of Entrepreneurship And Agricultural Research"

Abstract

I BEGIN WITH THREE INNOCENT QUESTIONS. WHO ARE THE ENTREPRENEURS IN OUR SOCIETY? WHAT DO THEY DO AS ENTREPRENEURS? What is the economic value of the function they perform? On the first question, entrepreneurship is a pervasive activity because of the social and economic dynamics that characterizes our society and because no one—not even ivory tower professors OR institutionalized priests—can escape the on-going dynamics. ACCOMMODATIONS and adjustments are the order of the DAY/ AND these entail entrepreneurship.

Disciplines

Agribusiness | Behavioral Economics | Entrepreneurial and Small Business Operations | Strategic Management Policy

DON KALDOR MEMORIAL LECTURE
"CONCEPTS OF ENTREPRENEURSHIP AND
AGRICULTURAL RESEARCH"

"INFLATIONARY EXPECTATIONS AND
FARMERS' RECENT ECONOMIC BEHAVIOR"

T. W. Schultz
1979 Nobel Prize in Economics
Professor, University of Chicago

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CONCEPTS OF ENTREPRENEURSHIP
AND
AGRICULTURAL RESEARCH*

I BEGIN WITH THREE INNOCENT QUESTIONS. WHO ARE THE ENTREPRENEURS IN OUR SOCIETY? WHAT DO THEY DO AS ENTREPRENEURS? WHAT IS THE ECONOMIC VALUE OF THE FUNCTION THEY PERFORM?

ON THE FIRST QUESTION, ENTREPRENEURSHIP IS A PERVASIVE ACTIVITY BECAUSE OF THE SOCIAL AND ECONOMIC DYNAMICS THAT CHARACTERIZES OUR SOCIETY AND BECAUSE NO ONE--NOT EVEN IVORY TOWER PROFESSORS OR INSTITUTIONALIZED PRIESTS--CAN ESCAPE THE ON-GOING DYNAMICS. ACCOMODATIONS AND ADJUSTMENTS ARE THE ORDER OF THE DAY, AND THESE ENTAIL ENTREPRENEURSHIP.

AT VARIOUS POINTS OVER THE LIFE CYCLE EVERY PERSON IS AN ENTREPRENEUR. NO ONE OF US IS SPARED BY THE TEST OF MAKING ADJUSTMENTS IN THE ALLOCATION OF OUR OWN TIME TO CHANGING CIRCUMSTANCES. THUS, IN THIS ALL-INCLUSIVE SENSE WE ARE ALL ENTREPRENEURS. SINCE OUR OWN TIME IS A SCARCE RESOURCE ALONG WITH OTHER

*Kaldor Memorial Lecture, Iowa State University, October 15, 1979.

SCARCE RESOURCES THAT ARE INVOLVED, ENTREPRENEURSHIP QUALIFIES AS AN ECONOMIC ACTIVITY. IT IS, HOWEVER, FAR FROM EASY TO ASCERTAIN THE FACTORS THAT DETERMINE THE SUPPLY OF ENTREPRENEURS AND THE DYNAMIC CONDITIONS THAT DETERMINE THE DEMAND FOR THEIR SERVICES. OUR KNOWLEDGE OF THE ATTRIBUTES AND THE STATE OF THE INFORMATION ON WHICH ENTREPRENEURS ARE DEPENDENT IS VERY LIMITED.

TO SET THE STAGE IT MAY BE HELPFUL TO CONSIDER ONE ASPECT, NAMELY THE PERVASIVENESS OF THE PROCESS OF RESOURCE ALLOCATION THAT OCCURS IN RESPONSE TO ECONOMIC DISEQUILIBRIA AS OPPORTUNITIES CHANGE. NO MATTER WHAT PART OF THE ECONOMY IS BEING INVESTIGATED, WE OBSERVE THAT PEOPLE ARE CONSCIOUSLY REALLOCATING THEIR RESOURCES IN RESPONSE TO CHANGES IN ECONOMIC CONDITIONS. THIS REALLOCATIVE PROCESS IS NOT RESTRICTED TO FARMERS AND BUSINESSMEN. PEOPLE WHO SUPPLY LABOR SERVICES FOR HIRE OR WHO ARE SELF-EMPLOYED ARE REALLOCATING THEIR SERVICES IN RESPONSE TO CHANGES IN THE VALUE OF THE WORK THEY DO. SO ARE HOUSEWIVES IN DEVOTING THEIR TIME IN COMBINATION WITH PURCHASED GOODS AND SERVICES IN HOUSEHOLD PRODUCTION. STUDENTS LIKEWISE ARE REALLOCATING THEIR OWN TIME AND THE EDUCATIONAL SERVICES THEY PURCHASE AS THEY RESPOND TO CHANGES IN EXPECTED EARNINGS ALONG WITH CHANGES IN THE VALUE OF THE PERSONAL SATISFACTIONS THEY EXPECT TO DERIVE FROM THEIR EDUCATION. WITHIN OUR UNIVERSITIES, ACADEMIC ENTREPRENEURSHIP IS MUCH MORE IMPORTANT THAN WE REALIZE. SHOW ME A UNIVERSITY THAT ALLOCATES ITS RESOURCES IN A PURELY ROUTINE MANNER OVER ANY EXTENDED PERIOD AND I WILL SHOW YOU THAT THAT UNIVERSITY IS ON

A DECLINING PATH. PRESIDENTS, DEANS, AND DIRECTORS OF RESEARCH ARE OBVIOUSLY ACADEMIC ENTREPRENEURS. SO ARE HEADS OF DEPARTMENTS WHO ARE WORTHWHILE HAVING. NOR DO I EXCLUDE THE TEACHING AND RESEARCH FUNCTIONS OF THE FACULTY. THE STOCK OF KNOWLEDGE AND THE THEORETICAL OPPORTUNITIES IN RESEARCH ARE NOT FIXED ONCE AND FOR ALL. ROUTINE TEACHERS ARE A LIABILITY AND ROUTINE RESEARCH WORKERS, WHICH CONTRADICTS THE MEANING OF RESEARCH, IF NEVERTHELESS THERE ARE SUCH, THEY ARE FAILURES. NOT LEAST IS THE FACT THAT CONSUMPTION OPPORTUNITIES ARE ALSO CHANGING, AND INASMUCH AS PURE CONSUMPTION ALSO ENTAILS TIME, HERE TOO PEOPLE ARE REALLOCATING THEIR OWN TIME IN RESPONSE TO CHANGING OPPORTUNITIES.

THE THRUST OF MY ARGUMENT THUS FAR IS THAT OVER OUR RESPECTIVE LIFE CYCLES ALL OF US, AS WELL AS EVERYBODY ELSE, GIVEN OUR DYNAMIC SOCIETY WITH SPECIAL REFERENCE TO THE ECONOMY, IS AN ENTREPRENEUR. WHETHER A PERSON IS BAD OR GOOD IN PERFORMING THIS FUNCTION IS QUITE ANOTHER MATTER.

IT WILL NOT SUFFICE, HOWEVER, TO DEAL ONLY WITH THE OBSERVABLE ALLOCATIVE RESPONSES PER SE. THERE IS THE QUESTION: WHAT DETERMINES THE ABILITY OF HUMAN BEINGS TO PERCEIVE THAT WHICH NEEDS TO BE DONE? WE NOW HAVE A SUBSTANTIAL BODY OF EVIDENCE WHICH SHOWS THAT EDUCATION TENDS TO ENHANCE THIS PARTICULAR ABILITY. AMONG THE PIONEERING STUDIES ARE THOSE OF FINIS WELCH AND WALLACE HUFFMAN IN THE AREA OF AGRICULTURE. OTHER SPECIFIC STUDIES PERTAIN

TO HOUSEHOLD PRODUCTION. IT IS NOTEWORTHY THAT MARGARET REID WHILE SHE WAS AT IOWA STATE PUBLISHED HER CLASSIC BOOK, ECONOMICS OF HOUSEHOLD PRODUCTION, LONG BEFORE THIS APPROACH BEGAN TO FLOURISH IN ACADEMIC RESEARCH.¹ THE EDUCATION OF LABOR IN THIS CONTEXT INCLUDING ITS EFFECTS ON MIGRATION HAS RECEIVED A GOOD DEAL OF RESEARCH ATTENTION. I HAVE DEVOTED A MAJOR SURVEY TO "THE VALUE OF THE ABILITY TO DEAL WITH DISEQUILIBRIA".²

THERE IS ALSO THE QUESTION, WHAT ARE THE SOURCES AND THE ATTRIBUTES OF THE ECONOMIC DISEQUILIBRIA THAT DETERMINE THE DEMAND FOR ENTREPRENEURS? THEORY TO DEAL WITH THIS ISSUE HAS BEEN MUCH NEGLECTED. THERE ARE SOME STUDIES BUT THEY ARE, IN MY VIEW, NOT VERY USEFUL FOR REASONS THAT I SHALL TOUCH ON LATER. THE CRITICAL AND UNSETTLED QUESTION PERTAINS TO THE ATTRIBUTES OF THE INFORMATION ON WHICH ENTREPRENEURS ARE DEPENDENT.

IN EXTENDING ECONOMIC THEORY TO ANALYZE THE FUNCTION OF ENTREPRENEURS, VIRTUALLY NO ATTENTION HAS BEEN GIVEN TO EITHER THE SUPPLY OF OR THE DEMAND FOR THE SERVICES OF ENTREPRENEURS. WE ARE INVENTIVE AND SOPHISTICATED IN APPLYING SUPPLY AND DEMAND ANALYTICAL TECHNIQUES TO LABOR, REPRODUCIBLE CAPITAL GOODS AND NATURAL RESOURCES, BUT NOT TO ENTREPRENEURS. THE ECONOMIC VALUE

¹MARGARET G. REID, ECONOMICS OF HOUSEHOLD PRODUCTION, NEW YORK: WILEY, 1934.

²T.W. SCHULTZ, "THE VALUE OF THE ABILITY TO DEAL WITH DISEQUILIBRIA", JOURNAL OF ECONOMIC LITERATURE, SEPTEMBER 1975.

THEIR ACTIVITIES IS CONCEALED BY THE CONCERN ABOUT PURE PROFITS AND PURE LOSSES THAT ARE NOT AND CANNOT BE ANTICIPATED. IT IS CLEAR FROM THE LITERATURE IN ECONOMICS THAT THE RISK-UNCERTAINTY DICHOTOMY HAS GREAT INTELLECTUAL APPEAL BUT ITS USEFULNESS IS LIMITED.

A SMALL GROUP OF ECONOMISTS USING AUSTRIAN THEORETICAL APPROACHES ARE ANALYZING ENTREPRENEURSHIP ANEW. I REFER HERE MAINLY TO ISRAEL M. KIRZNER'S COMPETITION AND ENTREPRENEURSHIP³ AND TO THREE RECENT UNPUBLISHED PAPERS BY KIRZNER, O'DRISCOLL AND RIZZO PRESENTED AT THE AEA MEETINGS OF AUGUST 1978. USING A LABOR THEORY OF VALUE, MY INVESTMENT IN THESE PAPERS IS LARGE. IT ENTAILED RE-READING KNIGHT, INCLUDING HIS PERCEPTIVE 23 PAGE PREFACE TO THE LSE REISSUE OF RISK, UNCERTAINTY AND PROFIT, DATED AUGUST 1933. MY MOST REWARDING ENDEAVOR HAS BEEN IN TRYING TO EXTEND AND USE THE VARIOUS EXPECTATION APPROACHES IN ANALYZING THE BEHAVIOR OF STUDENTS WHEN THE EXPECTED EARNINGS FROM EDUCATION CHANGE AND OF FARMERS COPING WITH TECHNOLOGICAL CHANGES AND WITH INFLATION. MY INVESTMENT HAS UNBOUBTEDLY MADE ME UNDULY CRITICAL. SURELY ENTREPRENEURSHIP IS NOT CONFINED SOLELY TO COLLECTING UNANTICIPATED WINDFALLS AND BEARING UNANTICIPATED LOSSES.

³ISRAEL M. KIRZNER, COMPETITION AND ENTREPRENEURSHIP, CHICAGO: UNIVERSITY OF CHICAGO PRESS, 1973.

ALTHOUGH THESE PAPERS SHARE THE ASSESSMENT THAT THERE IS NO ROOM FOR THE ENTREPRENEUR IN STANDARD EQUILIBRIUM THEORY, THE ECONOMIC LOGIC OF RECEIVED THEORY IS FOR THEM SO COMPELLING THAT NO ROOM FOR THE ENTREPRENEUR IS FORTHCOMING. UNANTICIPATED PROFITS AND LOSSES ARE NOT SUFFICIENT FOR THIS PURPOSE. TO ESTABLISH A USEFUL PLACE IN THEORY FOR THE ENTREPRENEUR, WHAT ENTREPRENEURS DO MUST HAVE SOME ECONOMIC VALUE. COLLECTING WINDFALLS AND BEARING UNANTICIPATED LOSSES ARE ONLY A PART OF THE STORY. IF ENTREPRENEURSHIP HAS SOME ECONOMIC VALUE, IT MUST PERFORM A USEFUL FUNCTION AND THE SUPPLY OF ENTREPRENEURS MUST BE CONSTRAINED BY SCARCITY, WHICH IMPLIES THAT THERE IS BOTH A SUPPLY OF ENTREPRENEURIAL CAPACITIES AND A DEMAND FOR ENTREPRENEURIAL SERVICES. MY ARGUMENT IS THAT UNTIL IT IS ESTABLISHED THAT ENTREPRENEURSHIP HAS AN ECONOMIC VALUE THAT IS IN FACT EARNED, ENTREPRENEURS HAVE NO PLACE OR ROLE IN ECONOMICS.

THE TROUBLE IS THAT ECONOMISTS ARE UNDULY INDENTURED TO ONE OF THE IMPLICATIONS OF KNIGHTIAN UNCERTAINTY. THIS PARTICULAR IMPLICATION OF "GENUINE (KNIGHTIAN) UNCERTAINTY" DOMINATES. IF THIS WERE THE SOLE VALID IMPLICATION, OUR MUCH VAUNTED PROFIT SYSTEM MERELY DISTRIBUTES IN SOME UNSPECIFIED MANNER THE WINDFALLS AND LOSSES THAT COME AS SURPRISES. IN AN ECONOMYⁱⁿ WHICH CHANGES AND DISEQUILIBRIA GO HAND IN HAND, I FIND KIRZNER'S CONCLUSION COUNTERPRODUCTIVE. HE CLOSSES HIS PAPER WITH THE ASSERTION THAT ENTREPRENEURS ARE NOT A USEFUL RESOURCE, WHAT THEY

DO, ACCORDING TO KIRZNER, HAS NO ASCERTAINABLE ECONOMIC VALUE. THUS THE CONCLUSION IS, AS IN STANDARD EQUILIBRIUM THEORY, ENTREPRENEURS IN AN ECONOMY WHERE DISEQUILIBRIA ARE THE ORDER OF THE DAY ARE NEVERTHELESS NOT A USEFUL RESOURCE. LET ME CITE HIM ON THIS ISSUE: "...ENTREPRENEURSHIP IS NOT TO BE TREATED AS A RESOURCE....THE MARKET NEVER RECOGNIZES ENTREPRENEURIAL ABILITY IN THE SENSE OF AN AVAILABLE USEFUL RESOURCE."

WHAT WENT WRONG IN ARRIVING AT THIS CONCLUSION? IT ARISES OUT OF KIRZNER'S CONCEPT OF THE UNIQUE VISION THAT HE ATTRIBUTES TO ENTREPRENEURS AND KIRZNER'S CONCEPT OF PURE PROFIT. WHETHER THERE ARE RETURNS THAT ARE NOT PURE PROFITS IS NOT MADE EXPLICIT. ACCORDINGLY, THE RETURNS THAT ACCRUE TO THOSE WHO BRING ABOUT THE EQUILIBRATING PROCESS DO NOT SURFACE. I HASTEN TO ADD THAT KIRZNER'S PAPER AND THE CONCLUSION THAT I HAVE CITED DO NOT DO JUSTICE TO HIS COMPETITION AND ENTREPRENEURSHIP. I FIND HIS BOOK A PERCEPTIVE ANALYSIS OF THE STATE OF ECONOMIC THEORY WITH RESPECT TO THE ENTREPRENEUR, BUT IN IT HE ALSO ENDS UP NOT SEEING THE REWARDS THAT ACCRUE TO THOSE WHO BRING ABOUT THE EQUILIBRATING PROCESS.

KNIGHT'S SEMINAL TREATISE IS NOT CONFINED TO THE PURE PROFITS AND PURE LOSSES THAT ARE A CONSEQUENCE OF SURPRISES. MUCH OF IT IS DEVOTED TO THE BEHAVIOR OF ENTREPRENEURS IN A DYNAMIC ECONOMY. KNIGHT DEALS AT LENGTH WITH THE RISK-UNCERTAINTY PROBLEM INHERENT IN NATURE, IN TECHNOLOGICAL CHANGES AND IN THE

INSTABILITY OF PRICES. KNIGHT LATER CAME TO SEE THAT ADVANCES IN KNOWLEDGE ARE THE MOST PERVASIVE AND IMPORTANT PART OF ECONOMIC PROGRESS.⁴ RETURNING TO THE TREATISE, IT IS RICH WITH INSIGHTS ON THE LIMITATIONS OF INFORMATION AND OF EXPECTATIONS AS CHANGE AND PROGRESS OCCUR UNDER ACTUAL CONDITIONS. KNIGHT IS INDEED MUCH CONCERNED WITH THE CONTRIBUTIONS OF ENTREPRENEURS TO THE EQUILIBRATING PROCESS. HE DEVOTES A LONG CHAPTER (CHAPTER V) TO THE THEORY OF CHANGE AND PROGRESS WITH UNCERTAINTY ABSENT AND HE RETURNS (CHAPTER XI) TO THIS "UNCHANGING PROPERTY OF CHANGING", NOTING THAT IT WOULD REQUIRE A COMPLETELY KNOWABLE WORLD WHICH IS IN HIS VIEW A PURE ARTIFACT OF OUR MINDS, A REFUGE TO WHICH WE FLEE. BUT THERE IS A CRITICAL, UNSETTLED ISSUE. IT PERTAINS TO KNIGHT'S "DISTINCTION BETWEEN RISK, AS REFERRING TO EVENTS SUBJECT TO A KNOWN OR KNOWABLE PROBABILITY DISTRIBUTION, AND UNCERTAINTY, AS REFERRING TO EVENTS FOR WHICH IT WAS NOT POSSIBLE TO SPECIFY NUMERICAL PROBABILITIES" (MILTON FRIEDMAN'S PRICE THEORY, 1976, P. 282). THE L.J. SAVAGE VIEW OF PERSONAL PROBABILITY DENIES ANY VALID DISTINCTION ALONG THESE LINES. I FIND THIS VIEW OF PERSONAL PROBABILITY PERSUASIVE.

IN MY THINKING WHAT IS REQUIRED ARE EXTENSIONS OF THEORY FROM WHICH WE CAN DERIVE IMPLICATIONS WITH RESPECT TO THE SUPPLY OF AND DEMAND FOR ENTREPRENEURSHIP IN ORDER TO DETERMINE ITS

⁴FRANK KNIGHT, "DIMINISHING RETURNS TO INVESTMENT", JOURNAL OF POLITICAL ECONOMY, 1944.

ECONOMIC VALUE. IN A VERY ELEMENTARY WAY I ATTEMPTED TO DO THIS IN MY 1975 JEL SURVEY. HOW MUCH CAN BE ACCOMPLISHED ALONG THIS LINE BY PURSUING, EXTENDING AND APPLYING THE CONCEPTUAL THEORY OF RATIONAL EXPECTATIONS IS AS YET TO BE DETERMINED. SURELY, ASPECTS OF ADAPTIVE EXPECTATIONS COULD BE MADE AN INTEGRAL PART OF RATIONAL EXPECTATIONS. THERE ARE, HOWEVER, DIFFICULT UNSOLVED PROBLEMS IN DETERMINING THE ACTUAL SOURCES OF INFORMATION THAT SHAPE AND ALTER OVER TIME THE RATIONAL EXPECTATIONS OF ENTREPRENEURS. DISEQUILIBRIA, WHETHER THEY ARE OF RECENT VINTAGE OR ARE BEING ANTICIPATED, ARE TRANSITORY EVENTS. THEY DIFFER BY TYPE AND THEY DIFFER OVER TIME. NO DOUBT THE EXPECTATIONS OF STUDENTS ARE ATTUNED TO THE VALUE OF EDUCATION IN OUR UNSTABLE ECONOMY. THE EXPECTATIONS OF FARMERS ARE IN TURN ATTUNED TO TECHNOLOGICAL CHANGES AND TO INFLATION. BUT WHENCE ARE THESE EXPECTATIONS DERIVED? IN WHAT MANNER ARE THEY PERCEIVED AND ACTED UPON? AS YET ANSWERS TO THESE QUESTIONS ARE NOT AT HAND.

AS IN ALL RESEARCH IN THE SCIENCES, AGRICULTURAL RESEARCH IS A VENTURESOME BUSINESS. IT ENTAILS THE ALLOCATION OF SCARCE RESOURCES, IT REQUIRES ORGANIZATION AND SOMEONE MUST DECIDE WHAT RESEARCH IS MOST WORTHWHILE TO UNDERTAKE GIVEN THE RESOURCE CONSTRAINTS AND THE STATE OF KNOWLEDGE. IT IS NOT A ROUTINE BUSINESS, LIKE WORKING ON AN AUTOMOBILE ASSEMBLY LINE, OR PLANTING AN ACRE OF CORN, OR BAKING A WELL KNOWN CAKE. RESEARCH IS A

DYNAMIC PROCESS AND IN A TRUE SENSE IT IS A VENTURE IN DOING THAT WHICH HAS NOT BEEN DONE IN AN ENDEAVOR TO ADD TO THE STOCK OF KNOWLEDGE. THE INDIVIDUALS WHO MAKE THESE RESEARCH DECISIONS ARE IN MY BOOK RESEARCH ENTREPRENEURS. WHO ARE THEY? TO WHAT EXTENT ARE THEY QUALIFIED? IS AGRICULTURAL RESEARCH IN THE UNITED STATES OVER-ORGANIZED? I SHALL ARGUE THAT IT IS INDEED OVER-ORGANIZED.

IN RETROSPECT THERE HAVE BEEN A NUMBER OF OUTSTANDING AGRICULTURAL RESEARCH ENTREPRENEURS. MY LIST INCLUDES THE DISTINGUISHED BIOLOGISTS E.C. STAKEMAN AND HERBERT K. HAYES OVER THE YEARS AS MEMBERS OF THE FAULTY OF THE UNIVERSITY OF MINNESOTA; GEORGE HARRAR'S SUCCESS IN DEVELOPING THE AGRICULTURAL RESEARCH ENTERPRISE OF THE ROCKEFELLER FOUNDATION AND THE MEXICAN GOVERNMENT IN MEXICO WHICH HAS GRADUALLY EVOLVED INTO CIMMYT STANDS IN MY VIEW AS A REMARKABLE ENTREPRENEURIAL ACHIEVEMENT; LIKEWISE THE SUCCESS OF RALPH CUMMINGS DURING THE YEARS THAT HE WAS IN INDIA PLACE HIM HIGH IN THIS CONTEXT. TURNING TO ECONOMICS, THE DISTINGUISHED WESLEY MITCHELL AND HIS ROLE IN DEVELOPING THE NATIONAL BUREAU OF ECONOMIC RESEARCH AND THE CAREERS OF JOHN D. BLACK AND, OVER THE LAST TWO DECADES, SIR JOHN CRAWFORD SURELY QUALIFY. AS AN ACADEMIC RESEARCH ENTREPRENEUR OF THE HIGHEST ORDER TO WHOM I HAVE A VERY LARGE DEBT DURING THE YEARS THAT I WAS AT IOWA STATE IS R.E. BUCHANAN.

IN CLOSING I SHALL DRAW BRIEFLY ON MY RECENT PAPER, "WHAT

ARE WE DOING TO RESEARCH ENTREPRENEURSHIP?"⁵ A FEW REMARKS ARE REQUIRED TO RESTATE THE FUNCTION OF ENTREPRENEURSHIP AS I TURN TO ITS APPLICATION TO RESEARCH.

THE DYNAMIC ATTRIBUTES OF RESEARCH ARE PERVASIVE BOTH IN THE DOMAIN OF ECONOMIC GROWTH AND IN THE CONDUCT OF ACTUAL RESEARCH. SUCH NEW KNOWLEDGE IS THE MAINSPRING OF ECONOMIC GROWTH. WERE IT NOT FOR ADVANCES IN KNOWLEDGE, THE ECONOMY WOULD ARRIVE AT A STATIONARY STATE AND ALL ECONOMIC ACTIVITIES WOULD BECOME ESSENTIALLY ROUTINE IN NATURE. OVER TIME NEW KNOWLEDGE HAS AUGMENTED THE PRODUCTIVE CAPACITY OF LAND, AND IT HAS LED TO THE DEVELOPMENT OF NEW FORMS OF PHYSICAL CAPITAL AND OF NEW HUMAN SKILLS. THE FUNDAMENTAL DYNAMIC AGENT OF LONG TERM ECONOMIC GROWTH IS THE RESEARCH SECTOR OF THE ECONOMY.

THE CONCEPT OF MEANINGFUL RESEARCH CONDUCTED TO ENHANCE THE STOCK OF KNOWLEDGE THAT IS USEFUL IN PRODUCTION AND CONSUMPTION IS INCONSISTENT WITH STATIC, UNCHANGING ROUTINE WORK ON THE PART OF SCIENTISTS. THE VERY ESSENCE OF RESEARCH IS IN THE FACT THAT IT IS A DYNAMIC VENTURE INTO THE UNKNOWN OR INTO WHAT IS ONLY PARTIALLY KNOWN. WHEREAS FUNDS, ORGANIZATION AND COMPETENT SCIENTISTS ARE NECESSARY THEY ARE NOT SUFFICIENT. AN IMPORTANT FACTOR IN PRODUCING KNOWLEDGE IS THE HUMAN ABILITY THAT I HAVE DEFINED AS RESEARCH ENTREPRENEURSHIP. IT IS AN

⁵T.W. SCHULTZ, "WHAT ARE WE DOING TO RESEARCH ENTREPRENEURSHIP?", IN TRANSFORMING KNOWLEDGE INTO FOOD IN A WORLDWIDE CONTEXT, WM. F. HUEG, JR. AND CRAIG A. GANNON, EDS., MINNEAPOLIS: MILLER PUBLISHING COMPANY, 1978, PP. 96-105.

ABILITY THAT IS SCARCE; IT IS HARD TO IDENTIFY THIS TALENT; IT IS REWARDED HAPHAZARDLY IN THE NOT-FOR-PROFIT RESEARCH SECTOR; AND IT IS INCREASINGLY MISUSED AND IMPAIRED BY THE OVER-ORGANIZATION OF OUR RESEARCH ENTERPRISES. WHAT IS HAPPENING IN AGRICULTURAL RESEARCH IS ON THIS SCORE NO EXCEPTION.

WHO ARE THESE RESEARCH ENTREPRENEURS? IN BUSINESS ENTERPRISES THAT ARE PROFIT ORIENTED, THE CHIEF EXECUTIVE OFFICERS PERFORM THE ENTREPRENEURIAL FUNCTION. THE SKILLED FACTORY WORKER IS NOT AN ENTREPRENEUR IN DOING HIS JOB. IN RESEARCH IT IS OTHERWISE. WHEREAS ADMINISTRATORS WHO ARE IN CHARGE OF A RESEARCH ORGANIZATION MAY BE ENTREPRENEURS, MUCH OF THE ACTUAL ENTREPRENEURSHIP IS A FUNCTION OF THE ASSESSMENT BY SCIENTISTS OF THE SCIENTIFIC FRONTIERS OF KNOWLEDGE. THEIR PROFESSIONAL COMPETENCE IS REQUIRED TO DETERMINE THE RESEARCH HYPOTHESES THAT MAY BE WORTHWHILE PURSUING.

BRIEFLY AND MUCH SIMPLIFIED, MY ARGUMENT IS THAT IN THE QUEST FOR APPROPRIATIONS AND RESEARCH GRANTS, ALL TOO LITTLE ATTENTION IS GIVEN TO THAT SCARCE TALENT WHICH IS THE SOURCE OF RESEARCH ENTREPRENEURSHIP. THE CONVENIENT ASSUMPTION IS THAT A HIGHLY ORGANIZED RESEARCH INSTITUTION FIRMLY CONTROLLED BY AN ADMINISTRATOR WILL PERFORM THIS IMPORTANT FUNCTION. BUT IN FACT A LARGE ORGANIZATION THAT IS TIGHTLY CONTROLLED IS THE DEATH OF CREATIVE RESEARCH, REGARDLESS OF WHETHER IT BE THE NATIONAL SCIENCE FOUNDATION, A GOVERNMENT AGENCY, A LARGE

PRIVATE FOUNDATION, OR A LARGE RESEARCH ORIENTED UNIVERSITY. NO RESEARCH DIRECTOR IN WASHINGTON CAN KNOW THE ARRAY OF RESEARCH OPTIONS THAT THE STATE OF SCIENTIFIC KNOWLEDGE AND ITS FRONTIER AFFORD. NOR CAN THE MANAGERS OF FOUNDATION FUNDS KNOW WHAT NEEDS TO BE KNOWN TO PERFORM THIS FUNCTION. HAVING SERVED AS A MEMBER OF A RESEARCH ADVISORY COMMITTEE TO A HIGHLY COMPETENT EXPERIMENT STATION DIRECTOR FOR SOME YEARS AND HAVING OBSERVED THE VAST ARRAY OF RESEARCH TALENT SUPPORTED BY FUNDS THAT WE AS A COMMITTEE HAD A HAND IN ALLOCATING, I AM CONVINCED THAT MOST WORKING SCIENTISTS ARE RESEARCH ENTREPRENEURS. BUT IT IS EXCEEDINGLY DIFFICULT TO DEVISE INSTITUTIONS TO UTILIZE THIS SPECIAL TALENT EFFICIENTLY. ORGANIZATION IS NECESSARY. IT TOO REQUIRES ENTREPRENEURS. AGRICULTURAL RESEARCH HAS BENEFITTED FROM ITS EXPERIMENT STATIONS, SPECIALIZED UNIVERSITY LABORATORIES, AND FROM THE RECENTLY DEVELOPED INTERNATIONAL AGRICULTURAL RESEARCH CENTERS. BUT THERE IS THE EVER-PRESENT DANGER OF OVER-ORGANIZATION, OF DIRECTING RESEARCH FROM THE TOP, OF REQUIRING WORKING SCIENTISTS TO DEVOTE EVER MORE TIME TO PREPARING REPORTS TO "JUSTIFY" THE WORK THEY ARE DOING, AND TO TREAT RESEARCH AS IF IT WERE SOME ROUTINE ACTIVITY.

THE TEXT OF WHAT I HAVE SAID IS SIMPLE. EVERYBODY IS AN ENTREPRENEUR AT VARIOUS POINTS OVER HIS OR HER LIFE CYCLE. AS

ENTREPRENEURS WE PERFORM A NECESSARY FUNCTION OF CONSIDERABLE ECONOMIC VALUE. IT IS A BIT DISCONCERTING THAT THE ENTREPRENEUR SHOULD BE A STRANGER IN STANDARD EQUILIBRIUM THEORY. NO WONDER THAT THE DETERMINANTS OF THE SUPPLY OF AND DEMAND FOR ENTREPRENEURS HAVE BEEN GROSSLY NEGLECTED.

THE TEXT THAT BEARS ON AGRICULTURAL RESEARCH ENTREPRENEURSHIP IS AS FOLLOWS:

1. THE HISTORY OF THE DEVELOPMENT AND ACHIEVEMENTS OF U.S. ORGANIZED AGRICULTURAL RESEARCH AND EXTENSION ACTIVITIES IS A GOOD VACCINE FOR NOT BECOMING INFECTED BY THE GLOOM AND PESSIMISM OF DOOMSDAY, LIMITS OF GROWTH, AND THE ANNUAL CROP OF NEW CRISES.

2. NO ONE IN WASHINGTON OR ELSEWHERE IN THE UNITED STATES ACTUALLY KNOWS THE ENVIRONMENTAL SPECIFICATIONS THAT WILL, OVER FUTURE DECADES, EQUATE OUR VALUES WITH THE USE WE MAKE OF OUR RESOURCES. STAY FLEXIBLE, SKEPTICAL, AND AFFIRMATIVELY CRITICAL. (SEE THE EDITORIAL "UNFREEZING THE FUTURE" BY CHARLES J. HITCH, SCIENCE, MARCH 4, 1977.)

3. THE STATE OF SCIENTIFIC KNOWLEDGE, ITS FRONTIER AND THE HYPOTHESES IT AFFORDS ARE NOT KNOWN BY RESEARCH DIRECTORS WHO DEPEND UPON THE COMPUTER FOR THEIR INFORMATION. IT IS THE COMPETENT WORKING SCIENTISTS WHO KNOW MOST OF THESE OPTIONS AND WHO ARE RESEARCH ENTREPRENEURS SO ESSENTIAL TO CREATIVE RESEARCH.

4. INASMUCH AS THE PRODUCTION OF KNOWLEDGE IS COSTLY, ALLOCATIVE DECISIONS MUST BE MADE. WHETHER OR NOT WE HAVE A TASTE FOR THE MARKET, THE PRICE SIGNALS PROVIDED BY THE MARKET ARE AN ESSENTIAL PART OF THE INFORMATION THAT SHOULD NOT BE NEGLECTED IN ALLOCATING FUNDS TO RESEARCH AND IN TURN IN ALLOCATING OUR OWN TIME AND THE FUNDS WE GET FOR THE RESEARCH ENTERPRISES WE PURSUE.

* * *

ON THE STEEP SLOPES OF THE RIFT VALLEY IN KENYA, THE LONELY CULTIVATOR DOES ALL HE CAN FOR HIS PLOT OF CORN. WHAT HAPPENS TO THIS MAN IS OF NO CONCERN TO THE SUN OR TO THE EARTH AND THE WINDS THAT SWEEP HER FACE. HIS BIT OF LAND IS HARSH; HIS CROP IS IN CONSTANT DANGER OF BEING DEVoured BY INSECTS AND PESTS. NATURE IS HOST TO THOUSANDS OF SPECIES THAT ARE HOSTILE TO THE ENDEAVORS OF THIS CULTIVATOR. IN THE ADVANCES OF AGRICULTURE, "KNOWLEDGE IS THE MOST POWERFUL ENGINE OF PRODUCTION; IT ENABLES US TO SUBDUE NATURE AND FORCE HER TO SATISFY OUR WANTS."⁶

⁶ALFRED MARSHALL, PRINCIPLES OF ECONOMICS, 8TH EDITION, BOOK IV, CHAPTER 1, LONDON: MACMILLAN AND COMPANY, 1930.

INFLATIONARY EXPECTATIONS
AND
FARMERS' RECENT ECONOMIC BEHAVIOR*

Theodore W. Schultz
University of Chicago

The whole question of how people formulate their expectations and how they proceed on shapes of these expectations is in very poor repair, really dull. All too little is known about the concept of expectation over time. In my review this morning one sees, I think, in a rather dramatic way how little we know in terms of trying to ascertain the inflationary expectations of people. I shall hold my remarks to two or three pages just to help give a setting of what I have in mind.

When the American Economic Association met last in Detroit, Harry Johnson gave an excellent paper on the monetary counter-revolution of economics. Following up on the thrust of his analysis he and I argued our respective views on whether inflation would replace unemployment as the dominant political issue in economic policy. We had a number of long discussions on this issue. We interpreted the prospects differently.

There has been ever since World War I a strong view that unemployment is the dominant, decisive, critical problem and thus a critical problem for economists. That view persists politically and it undoubtedly is the

* Presented during a seminar held with the Iowa State University Agricultural Economics faculty on October 16, 1979.

"cause" for the inflation that prevails in most industrial countries. The question is: will the inflationary issue now supercede the unemployment issue and become the dominant issue in the political context in democratic societies?

There is little room for doubt that the problem of inflation is becoming a top priority problem. My interpretation of the recent elections in Denmark, Sweden, the United Kingdom, Canada, and (as I would interpret the political agenda) in the United States is that the problem of inflation is being featured and put on top of the problem of unemployment.

Full employment has been the primary political objective of economic thinking since the early 1930s. There is our revival of monetary theory, but as yet there has been very little systematic explanation in economic thought on the response of private economic behavior to inflation. A few ad hoc, cursory studies are beginning to appear which proposit to show who is losing out and who is benefiting from inflation. The financial media has discovered that speculation in gold and other valuable objects including more durable commodities, capital goods, natural resources, or farmland have been increasing considerably as a means of hedging against inflation.

The first question seems odd in a way. Why are economists contributing so little to explaining price behavior that occurs in response to inflation? The literature that I know says very little on this matter. What economists thought they knew, judging from their own private portfolio management, has served them very badly. The advice economists gave to some of the universities (Yale, Harvard, Chicago, Rochester and others) looked at ex post was the wrong advice,

bad advice concerning inflation. University private pension funds or portfolios would have been much better off if they had bought into bonds or natural resources rather than in stocks. This is obviously the lack of wisdom of the past.

Why is the record of U.S. farmers in general on this issue vastly better than that of economists in their own private economic affairs? I would argue, and you may argue the contrary, that if you look at the problem of farmers in the last 10 years they have done essentially the right thing throughout the 10 percent rate of inflation. If you take that as evidence that they were making decisions consistently in tune to the rapid inflation, I give the economist very low marks while giving farmers a very high mark. Once I have said that, the next question arises, where do farmers get their information? Where do they get their expectations? How did they know that inflation was going to rise at as high a rate as it has?

I'd venture to say that the advice given to Iowa farmers since the beginning of the 1970s did not anticipate inflation. I hope I'm wrong, but I suspect I'm not wrong. Nor were economists capable of anticipating the rate of inflation for either the immediate future or a longer period ahead. That is the question now. What will be the rate of inflation for the next five years? We extrapolate trends. We have a nice way of looking back, of just pushing the trend into the future, but that is mechanical and has no knowledge. I have little faith in trends. That seems to me to be a very mechanical type of faith. I note here it could well be that farmers will continue to do better than we do in this respect.

What distinguishes the economic behavior of farmers during the past decade? They adopted an investment portfolio that is consistently strong with inflationary expectations. This is my argument. They increased their investment and held larger stocks of durable commodities than they did before by increasing their inventory of machinery (i.e., buying and overinvesting in machinery). This investment is certainly very wise if you believe in inflation.

I talked to a young farmer sitting on a combine he bought five years ago for \$18,000. The same machine would now cost \$55,000. The mistake he felt he made is that he should have bought a new one a year or two ago when prices began to rise. Although he is overstocked in machinery, each time he clearly made the right kind of investment decision in the sense of the rising monetary or nominal value of the equipment. He also bought more farmland, thereby reducing the acreage of land that was being rented.

I look back with some interest on the cornbelt to give two little snapshots. In 1979 the picture we now have is that the buyers of this land as a percent of the total buyers of farmland are 17% tenants, 57% farm owner-operators, 2% retired farmers, 11% young farmers, and 13% others. Then if you take the sellers, tenants weren't selling. The real sellers were retired farmers and estates. There was really no change at all in the proportion of absentee owners. The pictures of 1977 and 1975 are almost the same. The interpretation I give is that actual farmers were changing the stock in their favor. I interpret that as really strong evidence of a sort that this action was exactly what the farmer should have been doing in an inflationary environment such as we've experienced. Therefore we say at least ex post the inflationary expectations of farmers are generally consistent with the actual rate and kind of inflation we've had.

Can theory tell us the type of inflationary expectations that have determined the investment decisions of farmers and the source of their information? How do we as economists think about and try to get a hold on that issue? There are two directions you can go in terms of the literature in economics. One is the adaptive expectations hypothesis which includes experience of the sort we live on. This is extrapolation, a trend, or any other econometrician's model where we give a large weight to the past year's experience and so on.

Or you can take the rational expectations hypothesis which is not looking back, but in some sense is making a valid set of assessments or judgments of what the future is going to be like. Now I like to go the rational expectations route due to my own biases and figures. Then I still have to face the question, where did farmers get their information during recent years?

Comments by Wallace E. Ogg, Professor Emeritus

I intend to write about the questions. T. W. Schultz asked, "How were Iowa farmers able to arrive at expectations which motivated them to invest heavily in Iowa land during the last two decades of steadily rising land prices?" And "Why did not economists share those expectations?"

The answer seems quite straightforward. Iowa farmers throughout the sixties and the early seventies were very aware that prices of corn were dependably stable. Price supports changed very little. See table enclosed. Supply was sufficient most years to keep the price down very close to the loan level. Corn production technology was increasing yields at a dependable rate. See table. The market increase in land prices appears to be and maybe was a function of this dependable year-to-year yield increase. Of course the "conventional wisdom" of the 1960's properly recognized some farmers had underemployed labor and capital, needed more land to spread fixed costs and additional land gave a marginal return that made land at its going price a good investment. The weather was stable during the 60's and early 70's. No computers, no sophisticated statistical techniques, no clairvoyance was necessary for farmers to arrive at bullish expectations. They were right to buy but it turned out better than they expected.

At farm price policy meetings I held around Iowa in the 60's farmers usually complained about low support prices. I frequently pointed out in reply that farmers were bidding away the guaranteed stable prices and consistent yield increase into land values.

I predicted in the spring of 1973 during the debate on a new four year farm price support program, that if Congress set the target price for corn at \$1.38 this would be enough to raise the land price of Iowa farmland by 50%

in two years. I also was right. Also it turned out better than I expected but for another reason. We were into a new world trade and inflation situation with sharply increased export volume and higher farm prices. Farmers responded with enthusiasm to the appearance of shortages. Secular demand growing faster than secular supply from 72 to 75 seems to have caused the tripling of the Iowa land price from 1973 to 1979.

Now I would like to ask a relevant and I hope appropriate question. How can we economists help shape certain enough and accurate enough expectations so agriculture can make the drastic structural adjustment which probably will be needed to meet the prospective energy supply shortage for liquid fuel and natural gas?

I spend 15 years of my professional career on agricultural adjustment;; educating in Iowa and elsewhere in the United States about structural adjustment to the mechanization -- adjustment in farm size, price level, population, business and community. We attempted to explain what was happening and help people have appropriate expectations and also alternatives and decision-making framework to expedite individual adjustment and make the movement to a new equilibrium as painless as possible.

Who is going to facilitate the coming adjustment to energy? What kind of size, location and technique adjustment will be required? Who is spelling out the target? What is the prospective optimum combination of capital, labor and land without plentiful energy? Do we have the reservoir of knowledge so extension can assist this new structural adjustment? In 1959, Iowa State University established the Center for Agricultural and Economic Adjustment. When and who will establish a Center for Energy and Economic Adjustment?

U.S. Corn Price Support Level, Average Iowa Corn Prices,
Average Iowa Corn Yields & Iowa Average Land Values
Farmland -- 1960-1979

	U.S. Corn Loan Price/bu.	Iowa Farm Price Corn/bu.	Iowa Corn Yield/acre	Average Iowa Land Value/acre
1960	1.06	.94	68.5	261
1961	1.20	.96	75.5	261
1962	1.20	.96	77	267
1963	1.07	1.06	80	276
1964	1.10	1.08	77.5	291
1965	1.05	1.13	82	318
1966	1.00	1.19	89	354
1967	1.05	1.13	88.5	397
1968	1.05	1.01	93	409
1969	1.05	1.09	99	419
1970	1.05	1.17	86*	419
1971	1.05	1.21	102	430
1972	1.05	1.11	116	482
1973	1.05	1.81	107	635
1974	1.10	2.87	80	834
1975	1.10	2.66	90	1095
1976	1.50	2.45	91	1368
1977	2.00	1.99	86	1450
1978	2.00	2.04	117	1646
1979	2.00		127	1958

* The year of the Southern Leaf Blight